

SOT-23 Plastic-Encapsulate MOSFETS

SI2302 N-Channel 20V(D-S) MOSFET

Features

- $V_{DS} = 20V$, $I_D = 2.5A$
- $R_{DS(ON)} < 115m\Omega$ @ $V_{GS} = 2.5V$
- $R_{DS(ON)} < 85m\Omega$ @ $V_{GS} = 4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

Applications

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- Load Switch
- DSC

Description

The SI2302 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other battery powered circuits where high-side switching and low in-line power loss are needed in a very small outline surface mount package.

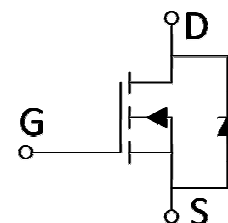
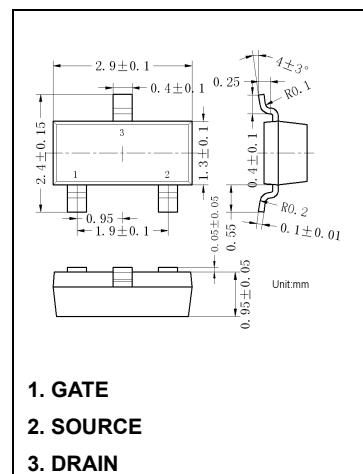
Marking: A2SHB.

Maximum Ratings ($T_a=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source voltage	20	V
V_{GS}	Gate-source voltage	± 8	V
I_D	Continuous drain current	2.5	A
I_{DM}	Pulsed Drain Current ¹⁾	10	
P_D	Power dissipation	0.9	W
T_J	Operating Junction	150	$^\circ C$
T_{stg}	Storage temperature	-55 to 150	$^\circ C$

Thermal Characteristic

Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient ($t \leq 5s$) ²⁾	139	$^\circ C / W$



Electrical Characteristics (T_a=25 °C unless otherwise noted)

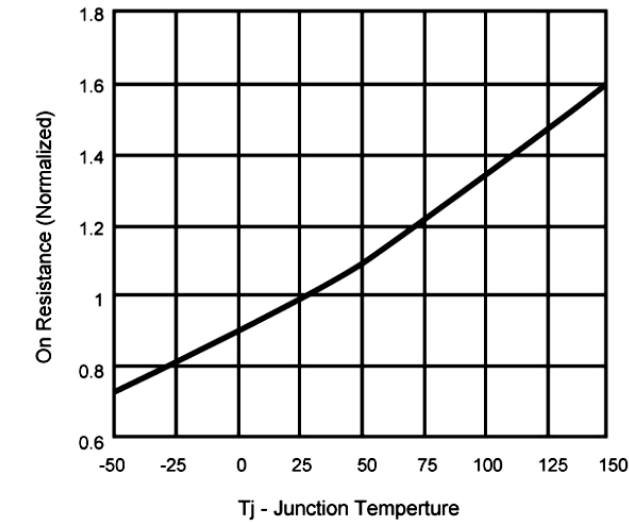
Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
Off Characteristics						
V _{(BR)DSS}	Drain- source breakdown voltage	V _{GS} = 0V, I _D = 250uA	20			V
I _{DSS}	Zero gate voltage drain current	V _{DS} = 20V, V _{GS} = 0V			1	μA
I _{GSS}	Gate-body leakage current	V _{GS} = ±8V, V _{DS} = 0V			±100	nA
On Characteristics						
V _{GS(th)}	Gate threshold voltage	V _{GS} = V _{DS} , I _D = 250uA	0.5		1.2	V
R _{DS(on)}	Drain-Source on-state resistance	V _{GS} = 4.5V, I _D = 2.5A		55	85	mΩ
		V _{GS} = 2.5V, I _D = 2.0A		65	115	
Dynamic Characteristics						
C _{iss}	Input capacitance	V _{GS} = 0 V, V _{DS} = 10V, f = 1MHz		450		pF
C _{oss}	Output capacitance			72		
C _{rss}	Reverse transfer capacitance			22		
Switching Characteristics						
t _{d(on)}	Turn-on delay time	V _{DD} = 10V, R _L =10Ω V _{GEN} = 4.5Ω, R _G =6Ω		9		ns
t _r	Rise time			23		
t _{d(off)}	Turn-off delay time			38		
t _f	Fall time			3		
Q _g	Total gate charge	V _{DS} = 10V, V _{GS} = 4.5V, I _D = 2.5A		9		nC
Q _{gs}	Gate-source charge			2.2		
Q _{gd}	Gate-drain charge			3		
Drain-source body diode characteristics						
V _{SD}	Diode forward voltage	V _{GS} = 0 V, I _S = 1A		0.75	1.2	V

Notes:

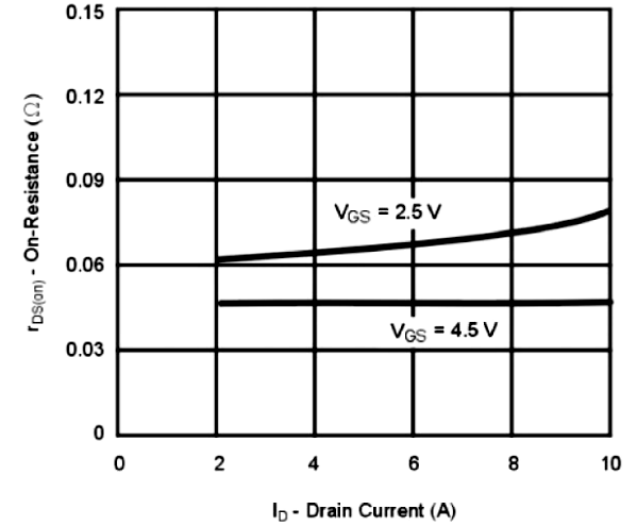
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.

Typical Electrical and Thermal Characteristics

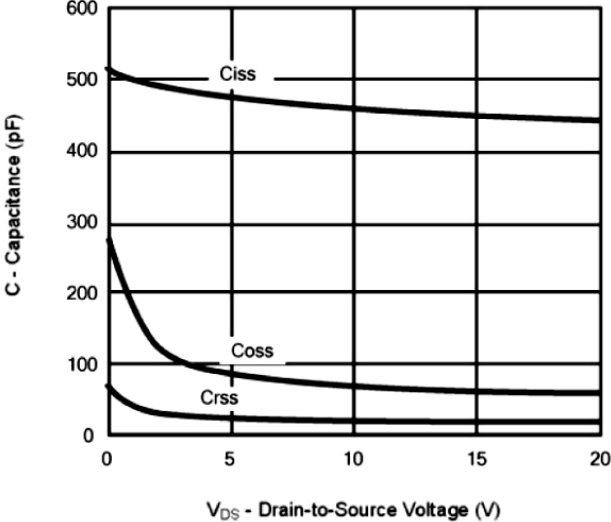
On Resistance vs. Junction Temperature



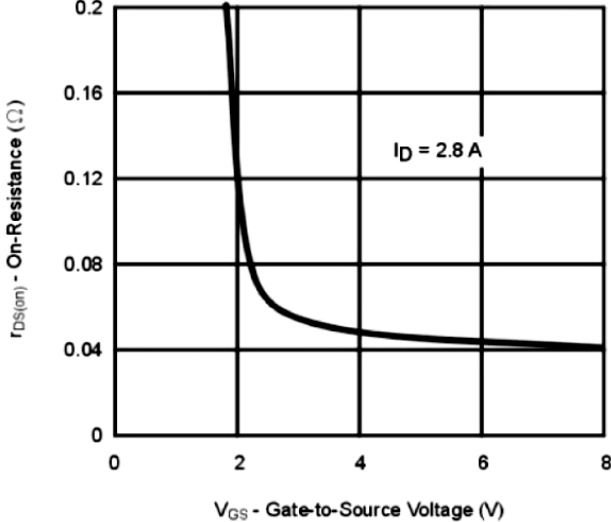
On-Resistance vs. Drain Current

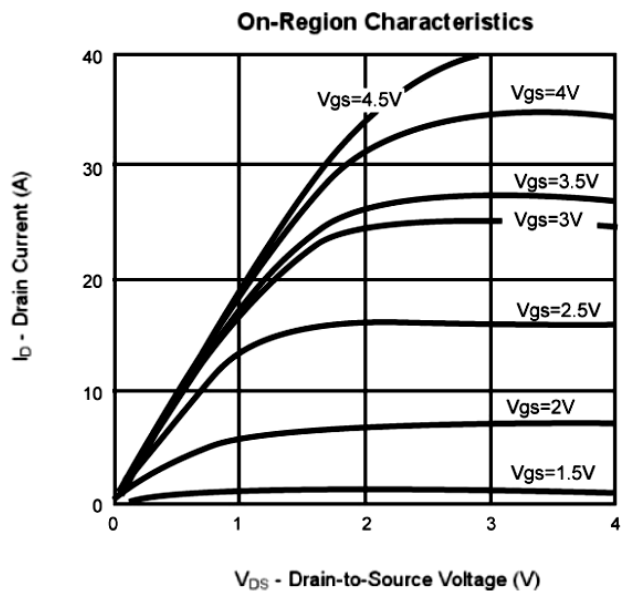
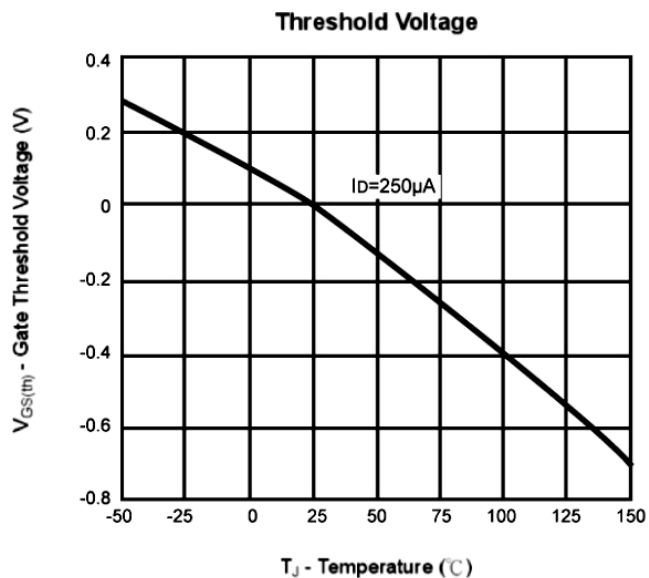


Capacitance



On-Resistance vs. Gate-to-Source Voltage





Typical Electrical and Thermal Characteristics(Cont.)

